

REMARKS

This is in response to the non-final Official Action currently outstanding with regard to the above-identified application.

Claims 1-23 were pending at the time of the issuance of the currently outstanding Official Action. Claims 1-18 are amended by the foregoing Amendment. No Claims are added, canceled or withdrawn by the foregoing Amendment. Accordingly, Claims 1-23 as hereinabove presented will constitute the claims under active prosecution in this application upon the entry of the foregoing Amendment.

The claims as they will stand upon the entry of the foregoing Amendment are reproduced above with appropriate status identifiers and showing the changes made as required by the Rules.

More particularly, in the currently outstanding Official Action, the Examiner has:

1. Acknowledge Applicants' claim for foreign priority under 35 USC §119 (a)-(d) or (f), and confirmed the receipt by the United States Patent and Trademark Office of the required copies of the priority documents;
2. Indicated that the drawings as filed on 5 April 2002 are acceptable;
3. Confirmed the receipt of Applicants' Information Disclosure Statement of 14 February 2003 by providing Applicants with a copy of the Form PTO-1449 that accompanied that Statement duly signed, dated and initialed by the Examiner in confirmation of her consideration of the art listed therein;

4. Indicated that Claims 9-18 and 21-23 are allowed;
5. Rejected claims 1 and 19 under 35 USC §103(a) as being unpatentable over the Moose, et al. (US Patent 6,459,745) reference, in view of the Junell et al. reference (US Patent No. 6,125,124);
6. Rejected claim 3 under 35 USC §103(a) as being unpatentable over the Moose et al and Junell et al references in view of the Tsuruoka, et al. reference (US Patent No. 6,549,589);
7. Rejected claim 4 under 35 USC §103(a) as being unpatentable over the Moose, et al and Junell et al references in view of the Nomura et al reference (US Patent No. 6,275,551);
8. Rejected claims 5 and 20 under 35 USC §103(a) as being unpatentable over the Moose et al and Junell et al references in view of the Tanaka reference (US Patent 6,498,822);
9. Rejected claim 7 under 35 USC §103(a) as being unpatentable over the Moose et al and Junell et al references in view of the Tsuruoka, et al. reference (US Patent No. 6,549,589);
10. Rejected claims 5 and 20 under 35 USC §103(a) as being unpatentable over the Moose et al and Junell et al references in view of the Tanaka reference (US Patent 6,498,822); and
11. Indicated that Claims 2 and 6 are objected to as being dependent upon a rejected base claim, and that those claims would be allowable if rewritten in independent form including all of the limitations of their respective base claims and any intervening claims.

No further comment regarding items 1-4 above is deemed to be required in these Remarks.

Further, in view of the following Remarks and the foregoing Amendment, Applicant believes that all of the claims of this application now are in condition for allowance. Accordingly, Applicants respectfully decline the Examiner's offer summarized in item 11 above to allow claims 2 and 6 if presented in independent form including all of the limitations of their respective base claims and intervening claims at the present time, without prejudice to the later adoption of that course should the future course of this prosecution warrant such action.

With regard to items 5-10, Applicants by the foregoing Amendment have removed all reference numbers from the claims of this application and have rephrased all of the means-plus-function claims originally presented so as to affirmatively recite the various elements/parts being claimed. Otherwise, Applicants respectfully traverse each and all of the Examiner's currently outstanding grounds for rejection. Applicants' bases for this traversal are set forth below.

The present invention solves the problem caused by the delay autocorrelation method adopted by conventional OFDM signal receivers in which the delayed version of the reception signal is used for frequency offset compensation. Accordingly, the bases for Applicants' current traversal of the Examiner's substantive rejections is that neither the Moose et al reference, nor the Junell et al reference, nor any combination of them, teaches, discloses or suggests a "*first memory means (51) for storing N (N is an integer of 2 or more) types of reference signals, each corresponding to an arbitrary portion in said start symbol*" (Emphasis added).

In particular, the Moose et al reference indicates that “(t)he phase modulation values contained in the frequency/timing recovery symbol are fixed and known (i.e., stored?) by the receiver. Also, they are selected in such a way that they contain two or more identical fractional parts, for example, identical first and second halves of the frequency/timing recovery signal.” (see, Col. 1, lines 59-64). Applicants understand this to mean that the Moose et al system sequentially selects redundant portions of the input signal and cross correlates those identical portions to obtain a fine frequency offset. Then, in the Moose et al system, sample values from the same frequency/timing recovery signal are selected using the timing of the first iteration and those samples are frequency shifted by the fine frequency offset obtained in the first iteration. Thereafter, the so adjusted sample values are cross correlated with stored known values such that a correlation peak occurs at the relative frequency shift index. (See Moose at Column 7, lines 5-43)

Therefore, Applicants respectfully submit that the Moose et al reference discloses a memory storing at least 2 types of reference signals from the so-called “preamble” portion instead of reference signals corresponding to arbitrary portions of the so-called “start” portion of a reception signal as herein claimed. Applicants respectfully submit that the Examiner apparently has missed the second portion of the Moose process in his analysis because he does not recognize the presence of a memory in the Moose reference.

Further, while the Junell reference appears to disclose a memory for storing N types of reference signals (i.e., a so-called “format”), the reference signals so stored as far as Applicants have been able to determine are not limited to “arbitrary portions of said start signal” as herein claimed. Rather, the so-called “format” of the Junell et al reference appears to include samples from the beginning, end and middle of the received signal.

Applicants respectfully submit that it also should be recognized that unlike the present invention, the reference signals in the Junell reference apparently are retained in memory for only one estimation round (i.e., the values in memory are replaced by the then current values during each estimation round). Further, Claim 1 of the Junell et al reference indicates that unlike the present invention, that reference is concerned with locating the beginning and the end of each pulse as a means of determining the appropriate frequency offset - a device and method totally different from the present invention.

Accordingly, Applicants respectfully submit that while both the Moose et al reference and the Junell et al reference contemplate the use of a memory that in some manner stores multiple types of reference signals, the memories of those references are not adapted to receive and store reference signals that correspond to "an arbitrary portion in said start signal" as herein claimed. Hence, Applicants respectfully submit that there are clear differences between the present invention on the one hand and the Moose et al reference and Junell et al reference on the other hand. Further, Applicants respectfully submit these differences do not reside exclusively in the method of use of the device claimed in claim 1 of this application (see allowed Claim 19). In other words, a memory adapted to store two (2) or more types of reference signals each corresponding to an arbitrary portion in a start symbol added ahead of a data symbol section is not the same as any of the memories disclosed in the cited references that themselves are adapted to store totally different values in the context of a device capable of performing a different method. Consequently, Applicants respectfully submit that neither of the cited references, whether taken alone or in combination with one another, are adequate to render the present claims unpatentable.

The foregoing rephrasing of the apparatus claims of this application from means-plus-function terminology into positive recitations of the various elements is respectfully submitted to further clarify the latter point.

Accordingly, Applicants respectfully submit that the above-discussed deficiency in the combination of the references relied upon by the Examiner is sufficient to overcome the currently outstanding rejection. This position is supported by the Manual of Patent Examining Procedure wherein the standards for the establishment of the *prima facie* case of obviousness that an Examiner is required to establish in support of all rejections under 35 USC 103(a) are set forth as follows:

To establish a *prima facie* case of obviousness under Section 103, Title 35 United States Code (35 USC §103), three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, ***the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.*** *In re Vaeck*, 947 F.2d 488, 20 USPQ2D 1438 (Fed. Cir. 1991). (See, Manual of Patent Examining Procedure §2142 (8th Edition), at page 2100-2121, *et seq.*) *Emphasis added*

Applicants respectfully submit that Examiner has failed to show all of the elements of the present invention as herein claimed within the four corners of the art that he has relied upon to reject the current claims. Also, Applicants respectfully submit that the Examiner has totally failed to demonstrate that the combination of features upon which he relies will perform the same function as the combination of elements actually herein claimed (note, the Examiner has allowed method claim 19 that utilizes the apparatus limitations of Claim 1). Consequently, Applicants respectfully submit that the currently outstanding Official Action fails to establish the requisite *prima facie* case necessary to maintain the currently outstanding rejections under 35 USC 103(a).

Therefore, in view of the foregoing Amendment and Remarks, Applicants respectfully submit that the claims of this application as they will stand after the entry of the foregoing Amendment are in condition for allowance. A decision so holding in response to this communication is respectfully requested.

Finally, Applicants believe that additional fees are not required in connection with the consideration of this response to the currently outstanding Official Action. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge and/or credit Deposit Account No. **04-1105**, as necessary, for the correct payment of all fees which may be due in connection with the filing and consideration of this communication.

Respectfully submitted,

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